

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Confirmation No.: 4085

HIGAMI et al.

Art Unit: 1795

Serial No.: 10/776,313

Examiner: Helen Ok Chu

Filed: February 12, 2004

Atty. Docket No. 026035-00009

For: ELECTRODE PASTE COMPOSITION

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

September 18, 2008

Sir:

Applicants request review of the final Office Action dated April 18, 2008, the period of response being extended to September 18, 2008, by the accompanying Petition for Extension of Time. This request is not accompanied by an amendment to the currently pending claims. Claims 1-5 are pending in this application. The outstanding Office Action is a Final Office Action in this application, and thus, this application qualifies for Appeal. A Notice of Appeal is filed herewith.

I. Rejection under 35 U.S.C. § 103(a) over Deibert et al. and Joshi et al.

The Office Action rejects claims 1-5 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,442,715 (Deibert), in view of U.S. Patent No. 5,454,922 (Joshi). Applicants submit that the rejection is made in error for at least the reasons set forth below.

Applicants respectfully submit that nothing in the cited art, taken alone or in combination, discloses or suggests a paste composition for making electrodes of fuel cells, comprising the specifically recited amounts of the following components: (1) 1 to 20 weight % of a carbon black supporting a hydrogen reduction catalyst, (2) 1 to 30

weight % of an electrolyte, (3) 1 to 50 weight % of an organic solvent with a boiling point of 100 to 200°C, and (4) 30 to 80 weight % of a water-soluble organic solvent with a boiling point of less than 100°C, as recited in independent claim 1 and dependent claims 2-5.

Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness at least because the Examiner failed to show that the cited prior art discloses, suggests, or renders obvious each and every limitation recited in claims 1-5 of the presently claimed invention, in light of the unexpected results of the present invention.

A. The Declaration of Junji Kawai demonstrates the criticality of the claimed ranges and the unexpected results achieved with the claimed invention

In response to the final Office Action, Applicants submitted a comprehensive Declaration providing comparative data showing the unexpected differences between the presently claimed paste composition with paste compositions having components present in amounts outside the claimed ranges. For example, Comparative Examples 5 and 8 relate to a composition with carbon black supporting a catalyst in an amount outside the claimed range; Comparative Examples 6 and 9 relate to a composition with an electrolyte in an amount outside the claimed range; Comparative Examples 7 and 11 relate to a composition with a water-soluble organic solvent with a boiling point of less than 100°C in an amount outside the claimed range; and Comparative Examples 10 and 12 relate to a composition with an organic solvent with a boiling point of 100 to 200°C in an amount outside the claimed range. The Declaration shows that the claimed paste compositions (as shown in Examples 1 to 3) unexpectedly have the properties of increased pore volume and increased voltage between terminals, compared to paste compositions which contain the claimed components, but in amounts outside of the claimed ranges.

Applicants submit that the Declaration, which compares the presently claimed composition to compositions, like ones disclosed in Deibert, which have components in amounts outside the claimed ranges, provides sufficient comparison to what the Examiner has cited to be the closest prior art, Deibert, as noted below. In fact,

Applicants note that, in addition to the four (4) comparative Examples in the specification, Applicants have provided eight (8) further comparative Examples, described above, which Applicants strongly argue are more than what is necessary to demonstrate unexpected results.

B. Applicants have rebutted a prima facie case of obviousness by showing unexpected results with the claimed invention

The Court of Appeals for the Federal Circuit has stated, “One way for a patent applicant to rebut a *prima facie* case of obviousness is to make a showing of ‘unexpected results,’ i.e. to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected.” *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995). The Federal Circuit has noted that this concept “applies most often to the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results.” *Id.* The Federal Circuit has also stated that “when an applicant demonstrates *substantially* improved results, as *Soni* did here, and *states* that the results were *unexpected*, this should suffice to establish unexpected results *in the absence of* evidence to the contrary.” *Id.* at 751.

Applicants submit that such unexpected results were demonstrated in the Declaration, and thus, the combination of Deibert and Joshi fail to disclose or suggest the Applicants’ claimed invention, as set forth in claims 1-5.

C. Deibert teaches several thousand possible combinations, but it does not teach the unexpected benefits of the specifically claimed combination in the claimed critical ranges

Deibert discloses a diffusion membrane electrode in which, generally, “[m]ixtures of organic liquids” may be employed (Deibert, col. 4, lines 53-54). The Office Action admits that Deibert fails to disclose the specific amount of the organic solvent with a boiling point of 100 to 200°C and the specific amount of the water-soluble organic solvent with a boiling point of less than 100°C (Office Action, page 3, lines 13-15), and relies on Examples 2-5 and 7-9 to suggest that one of ordinary skill in the art could

arrive at this feature through process optimization. The Office Action also admits that Deibert fails to disclose an electrolyte used as part of the electrode paste and relies on Joshi to disclose or suggest this feature.

Deibert teaches several thousand possible combinations of components that can be used to make a paste composition. Deibert lists a multitude of organic fluids that can be used (see col. 3, line 74 to col. 4, line 68), never once specifying that the presently claimed components in the presently claimed ranges can result in the unexpected properties of increased pore volume and increased voltage between terminals. Applicants submit that Deibert provides no guidance as to which components are critical, let alone the critical ranges of such components, and no rationale as to why such components in such critical ranges should be utilized.

D. The Examiner incorrectly states that there is motivation to discover an optimum value of a result effective variable, as the result effective variable is not taught or suggested

Applicants submit that the Examiner erred when she stated that “it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed value through process optimization, since it has been held that the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable values involve only routine skill in the art” (Office Action, page 3, line 20, to page 4, line 1).

Applicants note the general “rule that discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art” (*In re Boesch*, 617 F.2d 272, 273 (C.C.P.A. 1980)). However, Applicants submit that based on the teachings of Deibert, the presently claimed invention is not within the skill of the art, because Deibert provides absolutely no teaching or guidance of which variables or which components are “result effective.” In other words, Applicants submit that one of ordinary skill in the art would not be motivated to “optimize” the composition disclosed in Deibert, because Deibert does not teach or suggest which components or which variables of the composition are important for obtaining improved properties and beneficial results. Deibert merely teaches use of mixtures or plain organic solvents to

minimize cracking. Therefore, Applicants submit that it would not be obvious for one of ordinary skill in the art to optimize the composition, as one of ordinary skill in the art is not taught by Deibert what result effective variable should be optimized, much less how to optimize it. Therefore, Applicants submit that the cited references do not teach or suggest the presently claimed invention.

II. Conclusion

For all of the above reasons, a favorable decision and allowance of all pending claims are earnestly solicited. In the event this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, referencing Attorney Docket No. 026035-00009.

Respectfully submitted,



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